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Mississippi State UNIVERSITY

Center for Air Sea Technology

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USERS MANUAL

for the

INTERACTIVE

DATA

EDITING &

ANALYSIS

SYSTEM

(IDEAS) Version 1.0

Technical Note 01-93

FEBRUARY 1993

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**INTERACTIVE DATA EDITING
AND
ANALYSIS SYSTEM
(IDEAS)**

Version 1.0

USERS MANUAL

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ABSTRACT

The Interactive Data Editing and Analysis System (IDEAS) Version 1.0 has been developed to provide an interactive, graphical user environment for editing and analysis of oceanographic sounding (bathythermograph, conductivity-temperature-salinity, sound speed) profile data. This manual describes IDEAS software capabilities and provides instructions for its use.

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DESCRIPTOR

IDEAS USERS MANUAL

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1. Introduction

1.1 Purpose of the IDEAS software:

The Mississippi State University Center for Air Sea Technology(CAST) has developed a software package, called the **Interactive Data Editing and Analysis System (IDEAS)** that offers the oceanographer an enhanced ability to perform quality control on vertical ocean profiles of temperature and salinity, etc. Using IDEAS, the analyst, may interactively select the profiles from a specified database or data file and selectively analyze and edit them using a mouse-driven, point-and-click Graphical User Interface (GUI). The GUI facilitates interactive data editing and comparison on multiple simultaneous display windows, as well as selection of user options.

1.2 Operating environment:

The IDEAS software is written using the C programming language, Open Software Foundation's (OSF) Motif® for X-Windows, and the UNIRAS® proprietary graphics package. The datasets for IDEAS are managed using EMPRESS®, a proprietary Relational Database Management System (RDBMS). The datasets are stored and retrieved using the Navy Environmental Operational Nowcast System (NEONS), a set of generic database management tools which provide access to the RDBMS from either an interactive interface or directly from within an application program. NEONS was developed by the Naval Research Laboratory, Monterey, California. The IDEAS software, as currently implemented, runs under the UNIX® operating system on SUN® SparcStations® in an X-Windows environment.

1.3 System Requirements for IDEAS:

IDEAS requires the following software and hardware:

- a. UNIX® operating system,
- b. X-WINDOWS client-server manager and X libraries,
- c. The Open Software Foundation's (OSF) Motif® libraries,
- d. The UNIRAS® ag/X Toolmaster runtime graphics package,
- e. The Empress® RDBMS and

f. NEONS.

IDEAS is executable on SUN® workstations running SunOS® 4.1 or higher.

1.4 Getting Started:

Ensure that all the software and hardware requirements listed above have been met. Enter "ideas" from the keyboard at the system prompt. The GUI, as shown in Figure 1, will appear in a window on your screen. You may now begin an IDEAS work session. If you have problems, contact your local IDEAS site administrator.

2. OPERATING IDEAS

2.1 The Graphical User Interface Main Display:

The opening display window contains several user selectable options and status indicators - a "DATASET" list, a data "SUBSET" list, a "Specification for Observations" board, a Data Status Board; "REMARK" and "QUIT" buttons and "GRAPHICS CHOICE", "TOOLS", "DATABASE" and "HELP" pulldown menus (see Figure 1).

The "DATASET" Listbox: The "DATASET" listbox lists all datasets or regions. By default, no more than five (5) dataset names are visible. If the number of datasets exceeds five, a vertical scrollbar will appear, permitting you to scroll vertically through the list to identify and select a desired dataset.

Examples of dataset names: GINsea, Gulf Stream, Gulf of Mexico, MOODS_PROF, MASTER_PROF.

The data "SUBSET" Listbox: For each dataset listed in the "DATASET" textbox, there can be many data subsets. Upon selection of a dataset from the "DATASET" listing, IDEAS initiates a search of the database for its subsets. The "SUBSET" listbox is initially empty (blank). Its contents are determined by the dataset selected in the "DATASET" list. If the number of subsets is more than five, a vertical scrollbar will appear, allowing the user to scroll through the list and select the subset(s) of interest.

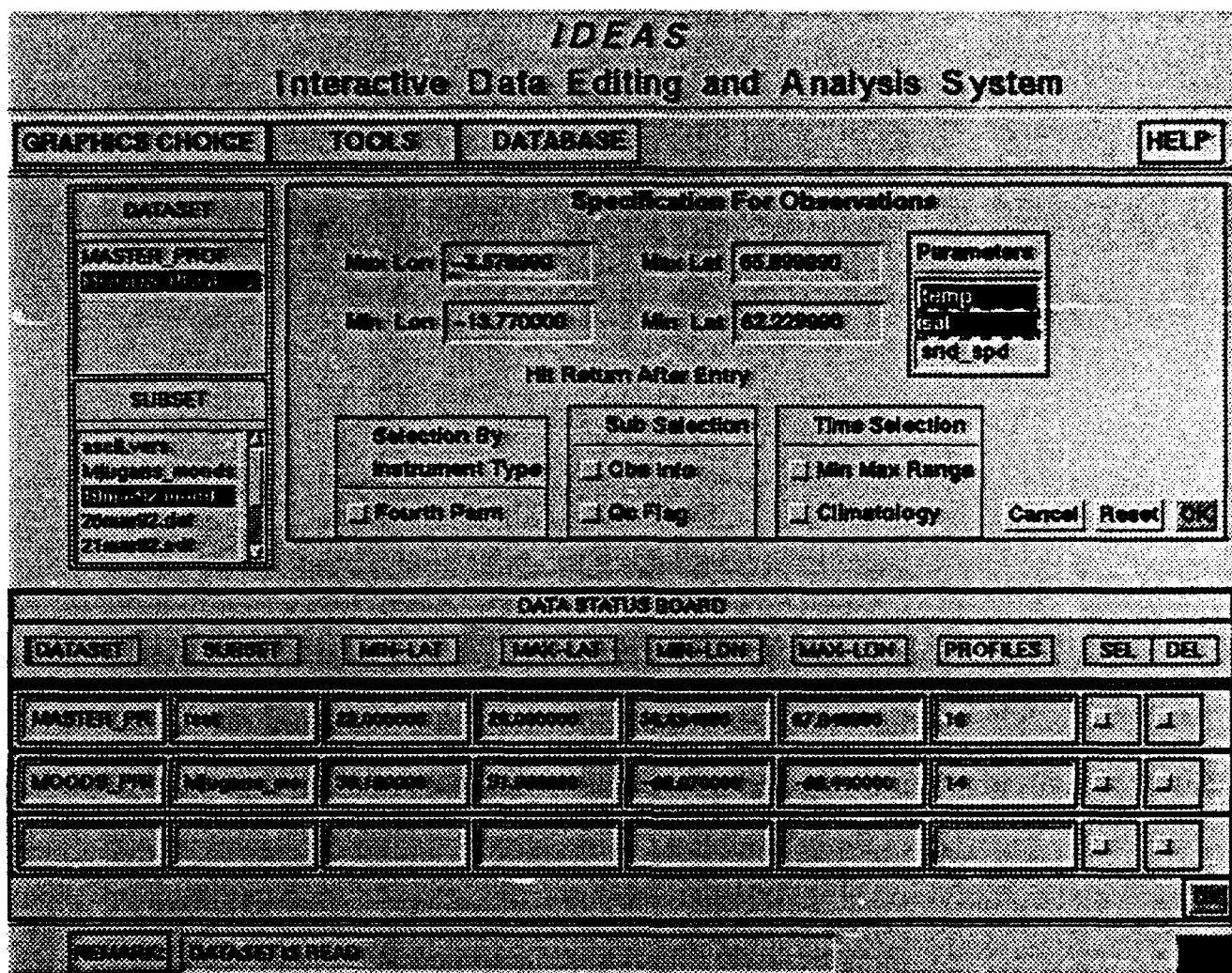


Figure 1. IDEAS Opening Graphical User Interface Window

Example: Iceland could be a subset of Ginsea. Here, GINsea may have several subsets. The subset feature allows the user to predefine and name portions of the main (larger) dataset. Subsets may be based upon any of several criteria, such as seasons or water masses. Subsets may be saved back to the database after editing is complete (from the "WRITE TO DATABASE" submenu under the "TOOLS" pulldown menu).

The "Specification for Observations" Board: The "Specifications for Observation" board permits further sub-sampling of a data subset by defining even smaller areas or regions and/or specific time windows of interest. This display board supports specification of maximum and minimum longitude,

maximum and minimum latitude, parameter selection (temperature, salinity, etc.), time range selection, and selection of subsets by quality control flags or observational information (e.g., instrument type). The "Specification For Observation" board also contains a "Reset", "Cancel" and "OK" button. After a data subset has been selected from the "SUBSET" listbox, default values from the pre-defined dataset are displayed in the latitude and longitude textboxes, and, the parameters available in the identified data subset are listed in the "Parameters" listbox. You may change the default longitude and latitude range values by clicking within the appropriate textbox and entering new values from the keyboard (press the "return" key when finished). You must select one or two (but no more) parameters from the "Parameters" listbox.

Next, select "Min Max Range" or "Climatology" from the "Time Selection" box.

a. "Min Max Range": When you click on the "Min Max Range" button, a time (date) range dialog window will appear as illustrated in Figure 2.a. The "Min Max Range" option requires that you set the minimum and maximum time range in this dialog window. To set the minimum and maximum time range, first click on a time range in the listbox on the left side of the window; then, adjust the sliding scalebars to set desired values for minimum and maximum date and time elements in the labeled textboxes to the right. You also have the option of altering default time range values by clicking on the labeled textboxes and entering new values from the keyboard. Click the "OK" button to confirm your selection. Click "CANCEL" to leave the time range dialog window without making a selection.

| | | | | | | | | | | | | |
|------------------|----------|----|----|----|----|------|------|-----|----|-----|----|--------|
| 5-1-1940-5-10-99 | Min Date | MM | 1 | DD | 1 | YYYY | 1957 | Hrs | 0 | Min | 0 | OK |
| | Max Date | MM | 12 | DD | 31 | YYYY | 1957 | Hrs | 23 | Min | 59 | Cancel |

Figure 2.a. Time Range Dialog Window

b. "Climatology": When the "Climatology" button is pressed, a climatology dialog window appears as shown in Figure 2.b. You may select any number of months, in any order, from the month listbox at the left of the window. Optionally, you may change the default Day and Year by clicking the corresponding textbox and explicitly entering their values from the keyboard.

Click the "OK" button to confirm your selection. Click "CANCEL" to exit the climatology dialog window without making a selection.

| | | | | | | | |
|----------|----|----|------|------|----|----|----|
| January | DD | 1 | YYYY | 1957 | Mo | 0 | OK |
| February | DD | 21 | YYYY | 1957 | Mo | 22 | |
| March | | | | | | | |

Figure 2.b. Climatology Dialog Window

You may further subdivide the dataset by options available in the "Sub Selection" box ("Obs Info" and "Qc Flag" buttons) and the "Selection By...." ("Fourth Parameter") box. Selections made using these buttons are dataset specific in most instances. IDEAS displays a dialog window wherein you may define the boundaries, limits or values associated with the selection criteria of interest. The "Obs Info" button allows subselection of the data based on meta information included with an observation (e.g., cruise number and instrument type). The "Qc Flag" button allows subselection based on the quality control flags accompanying the observations. The "Selection By ..." box accesses a "Fourth Parameter" that can be specified for a given data subset. The "Fourth Parameter" may be instrument type, bottom depth*, or some other criteria of importance to the user. The name of the "Fourth Parameter" is appended to the "Selection By ..." label when a data subset is selected from the "SUBSET" listbox.

The "Reset" button is activated upon selection of a data subset from the "SUBSET" listbox. It deselects all the subselections previously made but retains the dataset and data subset selections made in the "DATASET" and "SUBSET" listboxes. The "Cancel" button deselects all subselections and the dataset/subset selections. Once the "OK" button is clicked, the profiles are retrieved according to the selection criteria defined in the "Specification For Observation" board. The "OK" button is not usable until after a dataset and data subset have been selected from the "DATASET" and "SUBSET" listboxes.

A summary of the retrieved data is displayed in the "Data Status Board". Up to three (3) data subsets may be available in memory. All subsequent actions are performed on data resident in memory. The original data in the database or files remain unaltered during the editing and analysis process. Edited data may be

* "bottom depth", as used here, is not the depth of water; rather, it is the specified depth (in meters) which a profile must meet or exceed to fulfill the selection criteria.

explicitly saved to new files and/or into the database.

Data Status Board: The "DATA STATUS BOARD" presents information about retrieved data subsets. The information consists of the following:

- "DATASET" name,
- "SUBSET" name,
- minimum (min) latitude ("MIN-LAT"),
- maximum (max) latitude ("MAX-LAT"),
- minimum (min) longitude ("MIN-LON"),
- maximum (max) longitude ("MAX-LON"),
- and number of "PROFILES" read.

The "DATA STATUS BOARD" also has two toggle buttons for each data subset in memory. The "SEL" (select) button is clicked to identify a specific data subset. The "DEL" (delete) button is clicked to remove a specific data subset from memory. Deletion of a data subset makes room for a new dataset/subset, if necessary, and clears the entry from the "DATA STATUS BOARD". Click the "OK" button to signal the end of "DATA STATUS BOARD" manipulations. The following procedures apply to the "DATA STATUS BOARD":

1. To delete a data subset using the "DEL" button, you must first toggle (deselect) the subset using the "SEL" button.
2. You cannot select more than one data subset at a time. Before selecting another data subset, toggle the "SEL" button on the currently active (selected) data subset, if any.

"REMARK": The "REMARK" textbox located at the bottom of the display is used to indicate the status of IDEAS execution and to provide other information such as the occurrence of errors.

"GRAPHICS CHOICE": Clicking the "GRAPHICS CHOICE" menu header button in the upper left corner of the display produces a pulldown menu. This menu presents a list of selectable graphics options. In order to activate a graphics function, a data subset must have been previously activated (selected) in the "DATA STATUS BOARD".

“TOOLS”: The **“TOOLS”** menu header button adjacent to the **“GRAPHICS CHOICE”** button also produces a pulldown menu. When clicked, the **“TOOLS”** button produces a list of utility options.

“DATABASE”: The **“DATABASE”** menu header to the right of the **“TOOLS”** button produces a pulldown menu offering (1) direct transfer of profile data from a file to the database, and (2) the option to delete a profile from the selected data subset.

“HELP”: The **“HELP”** menu header button located in the upper right corner of the main display offers information on the IDEAS user interface and profile data.

“QUIT”: When the **“QUIT”** button is clicked, IDEAS terminates and returns you to the UNIX system prompt.

2.2 Retrieving Datasets from the Database:

The following steps are required to retrieve a dataset from the database:

A. Select the desired dataset by clicking on the **“DATASET”** list. A list of subsets for that dataset will then appear in the **“SUBSET”** list.

B. Select a data subset (version) by clicking on an entry in the **“SUBSET”** list. Default values for region boundaries and parameters will appear on the **“Specification for Observation”** Board.

C. You may prescribe your own maximum and minimum latitudes and longitudes by clicking on the textboxes and entering values from the keyboard (press **“return”** when finished). When you are satisfied with the values, proceed to step D.

D. Click on the **“Parameters”** list entries. You may select no more than two parameters.

E. You must click either the **“Min Max Range”** or **“Climatology”** button in the **“Time Selection”** box.

(1) When "Min Max Range" is selected, a date range dialog window appears (Figure 2.a.). Click on the "Time Range" list and use the sliding horizontal scales to set the minimum and maximum time. You may also input your own minimum and maximum dates and times by clicking on the labeled text boxes and enter values from the keyboard. Press "OK" to exit from the range dialog window.

(2) When the "Climatology" button is clicked, a climatology dialog window appears (Figure 2.b.). Select any number of months by clicking on their names in the months listbox. You may specify a day-of-the-month range, a range of years, or a range of hours by clicking on the textboxes and entering values from the keyboard. When you are satisfied with the values, click "OK" to exit. Clicking the "Cancel" button closes the dialog window without making a selection.

(3) Optionally, the user can further subdivide the data by observation information ("Obs Info") such as Cruise ID, bottom depth, quality control (Qc) flags, instrument type, etc.

F. Click the "OK" button in the "Specification for Observations" board. You will see the message "READING FROM DATABASE" in the "REMARK" textbox. When the data retrieval is complete, the data subset will be listed in the "DATA STATUS BOARD".

G. Now you are ready to choose a graphics choice, or, you may select another dataset by repeating steps A through F, above. The "DATA STATUS BOARD" can contain no more than three data subsets at a time.

2.3 Graphics Choices:

Once you have selected the profile data subsets and they are listed in the Data Status Board, you may choose a "GRAPHICS CHOICE" from the pull-down menu. Click on "GRAPHICS CHOICE" and make your selection from the pull-down menu. The choices on the pull-down menu may be selected in any order. Only one of the options may be applied to the profile data at any time.

2.3.1 Multiview:

The purpose of "MULTIVIEW" is to allow the user to simultaneously view the chosen parameter(s) as a depth vs. parameter value plot and as a plot of the geographic location of the data. If a dataset with two parameters has been

selected, a composite plot of these two parameters is also displayed. The user can then analyze and interactively edit within any one of the plot displays using the mouse. At each editing, the user will be asked to flag (tag) the edited profiles as "GOOD", "BAD", or "SUSPECT" to assist in identifying questionable data.

When the "MULTIVIEW" graphics choice is selected, a window will appear as shown in Figure 3. Initially, all data will be plotted in GREEN. If only one parameter is chosen, only the two bottom windows are shown. If two parameters are selected, four plot displays will appear. Before editing, you must become familiar with the IDEAS responses to mouse button clicks:

- The **Left** mouse button activates one of the four possible plot displays for editing.

- The **Middle** mouse button defines the corners of a polygon specified by the user.

- The **Right** mouse button closes the polygon, i.e., it connects the points of the user-defined polygon in the order created.

A Word of CAUTION: Each time a dataset in memory is modified within the "MULTIVIEW" window, those changes will become permanent in memory when the window is closed ("QUIT" button). If you are merely experimenting or do not actually intend to modify dataset flags, reset them to their initial values by clicking the "RESET FLAG" menu item via the "OPTIONS" button before you click the "QUIT" button. Flag settings do not become permanent in the database until the dataset is re-written to the database from the "WRITE TO DATABASE" menu item under the "TOOLS" pulldown menu of the main display.

The following procedures apply to the "MULTIVIEW" option:

A. Activating a Plotting Display. Before interacting with a plot display, the desired display must be activated. Activate a display by clicking the left mouse button anywhere within the desired window. The border color of the activated plot display will change to blue. Border colors of the remaining plot displays will not change.

B. The "OPTIONS" Button. Initially, all data is plotted in GREEN. To determine if any of the displayed profiles have been tagged, click the "OPTIONS" button. When clicked, the "OPTIONS" button produces a pulldown menu

offering options for indicating good ("GOOD ONLY"), suspect ("SUSPECT ONLY"), or bad ("BAD ONLY") profiles. Good profiles are plotted in WHITE; suspect profiles in YELLOW, and bad profiles in RED. The "OPTIONS" button also provides a facility for changing the maximum and minimum values for the x- and y- axes ("SCALE"), and resetting the tags assigned to plotted data ("RESET FLAG").

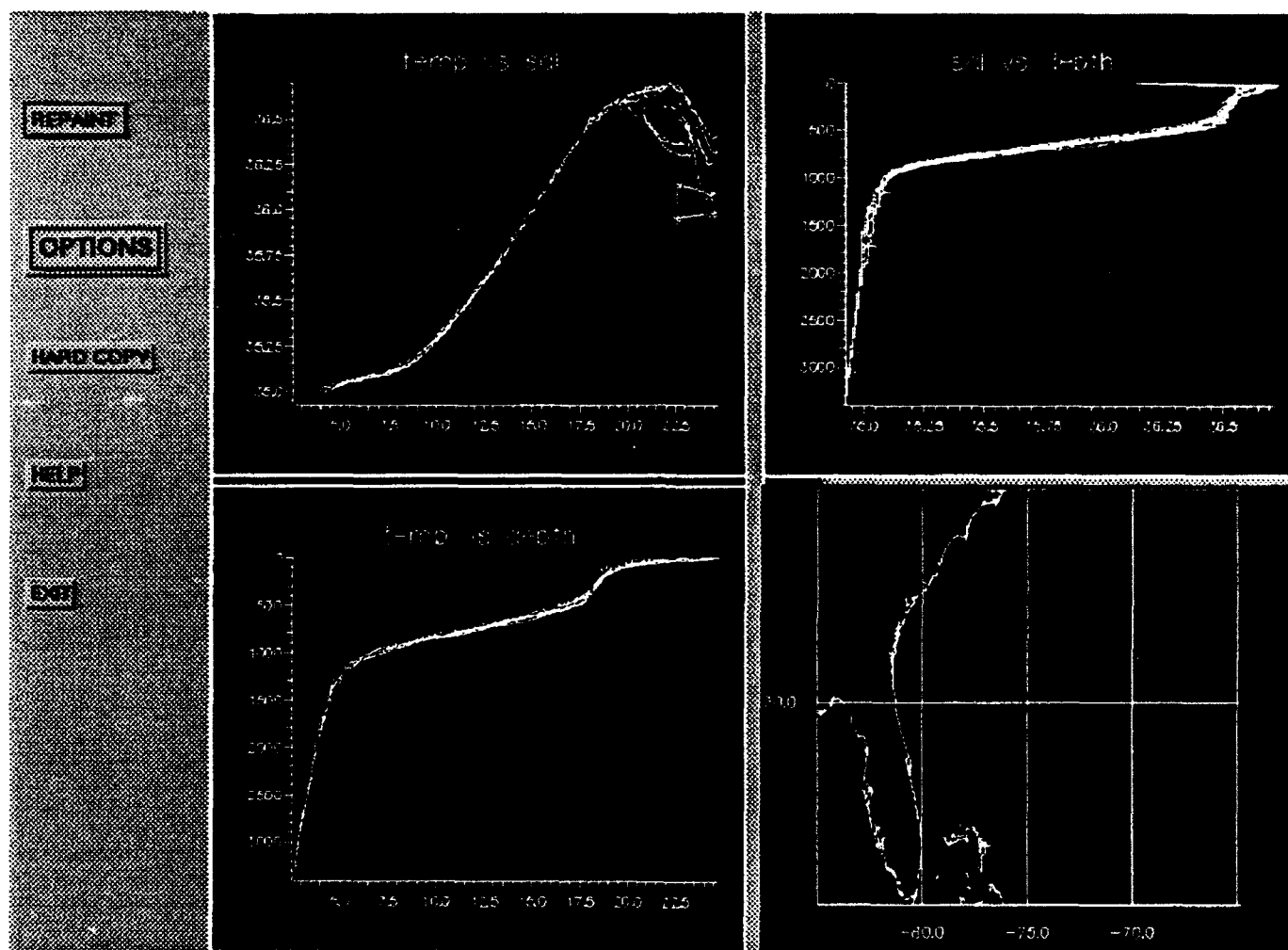


Figure 3. Multiview Window

Clicking the choices available from the "OPTIONS" button invokes the following behavior:

- (1) "GOOD ONLY" - all profiles currently tagged as "GOOD" will be replotted in WHITE.
- (2) "SUSPECT ONLY" - all profiles currently tagged as "SUSPECT" will be replotted in YELLOW.

(3) "BAD ONLY" - all profiles currently tagged as "BAD" will be replotted in RED.

(4) "SCALE" - a dialog box will appear wherein the maximum and minimum values for the x- and y- axes can be changed. You change the values by clicking an appropriate textbox and editing/changing the pre-existing value from the keyboard. Click "DONE" when satisfied with the values. Click "CANCEL" to exit the dialog box without changing the scale. The active plot display will be replotted using the new scale parameters.

(5) "RESET FLAG" - tags which have been set during the current "MULTIVIEW" session are reset to their original values. This option has no effect on flag values in effect when the "MULTIVIEW" option is selected.

B. Selecting Profiles. The "MULTIVIEW" window allows you to select one or more individual profiles and tag them as good, bad, or suspect for future editing. These profiles are identified by construction of a closed polygon that captures (encloses) at least one plotted data point from the desired profile(s). Using the middle mouse button, click to identify a series of corner points of a polygon in the area of interest. **You must specify these corner points in a clockwise direction.** Use the right mouse button to close the polygon after all corner points have been specified.

C. Tagging Profiles. Profiles selected (tagged) by polygon construction will be replotted in BLUE in all windows and a dialog box containing tagging options will appear. You may choose to tag the selected profile as "GOOD", "SUSPECT", or "BAD". If you do not desire to tag the selected profiles, click the "CANCEL" button. **Once tagged as "BAD", a profile cannot be reselected or retagged as "GOOD" or "SUSPECT" via the polygon construction procedure;** to recover from erroneously specified "BAD" profile tags, click the "RESET FLAG" menu item from the "OPTIONS" pulldown menu. Once you have tagged the selected profiles, or, if you have clicked the "CANCEL" button, the dialog box will disappear. You will not see any immediate changes in the plotting display windows as a result of profile tagging. The "GOOD ONLY", "SUSPECT ONLY" and "BAD ONLY" choices within the "OPTIONS" pulldown menu will allow you to view the newly tagged profiles in their newly assigned color codes.

D. Repaint. When the "REPAINT" button is clicked, the selected window is refreshed. All profiles are replotted in GREEN. Tags are unaffected. The purpose of this button is to clear previously constructed polygons from the active display.

E. Hardcopy. When you click the "HARD COPY" button, the graphics in the active profile plot display is sent to the default printer.

F. Quit. Click the "Exit" button to close the "MULTI VIEW" window.

2.3.2 Inserting Profiles:

"PROFILE INSERTION" allows you to create synthetic (artificial) profiles. IDEAS provides two options for creating synthetic profiles: (1) by constructing them manually, or (2) by selection from among the existing vertical profiles with reference to depth. Once you have constructed a profile, you may insert it in any desired geographical location. Then, you must provide the time (month) which the profile represents. When the "PROFILE INSERTION" option is chosen, a window will appear as shown Figure 4.

Manual Creation and Insertion of Synthetic Profiles: Manual creation of profiles is accomplished in the left window (see Figure 4). Using the left mouse button, select the left window (the window border will then change its color to dark blue). Using the middle mouse button and starting at the surface level, click to locate a series of points that define the synthetic profile; points should be at successively lower depths. Once the points have been defined, click the right mouse button to connect them, thereby creating the new profile. Once the new profile has been constructed, click the left mouse button within the MAP window (located at the lower right of the display) to activate it (again, the window border will change to dark blue). You may then use the middle mouse button to click at the location(s) where you wish to insert the new profile. You may repetitively place the profile at any number of geographic locations. Click the right mouse button to indicate that you are finished inserting the new profile. A "MONTH" dialog box will then appear. Select a time (month) and click the "INSERT" button to complete the insertion process.

Creating and Inserting Synthetic Profiles from Existing Profiles: Using the left mouse button, click within the upper right window to activate it (the window border will change its color to dark blue). Using the middle mouse button identify the corner points of a polygon that contains a portion of the desired profile. (Note: (1) You must specify the corner points in a clockwise direction. (2) See "SCALE" under "Options", below, for information on zooming if original scale of profile plot is too small. (3) If the polygon contains no profiles or more than one profile, an error message will be displayed in the "REMARKS" textbox.) Use the right mouse button to close the polygon. Once an existing profile has been selected, it will appear in blue. Click the left

mouse button within the MAP window to activate it. You may then use the middle mouse button to click at the location(s) where you wish to insert the existing profile. You may repetitively place the profile at any number of geographic locations. Clicking the right mouse button indicates that you have finished inserting the existing profile and invokes a "MONTH" selection dialog box. Select a month and click the "INSERT" button to complete the insertion process.

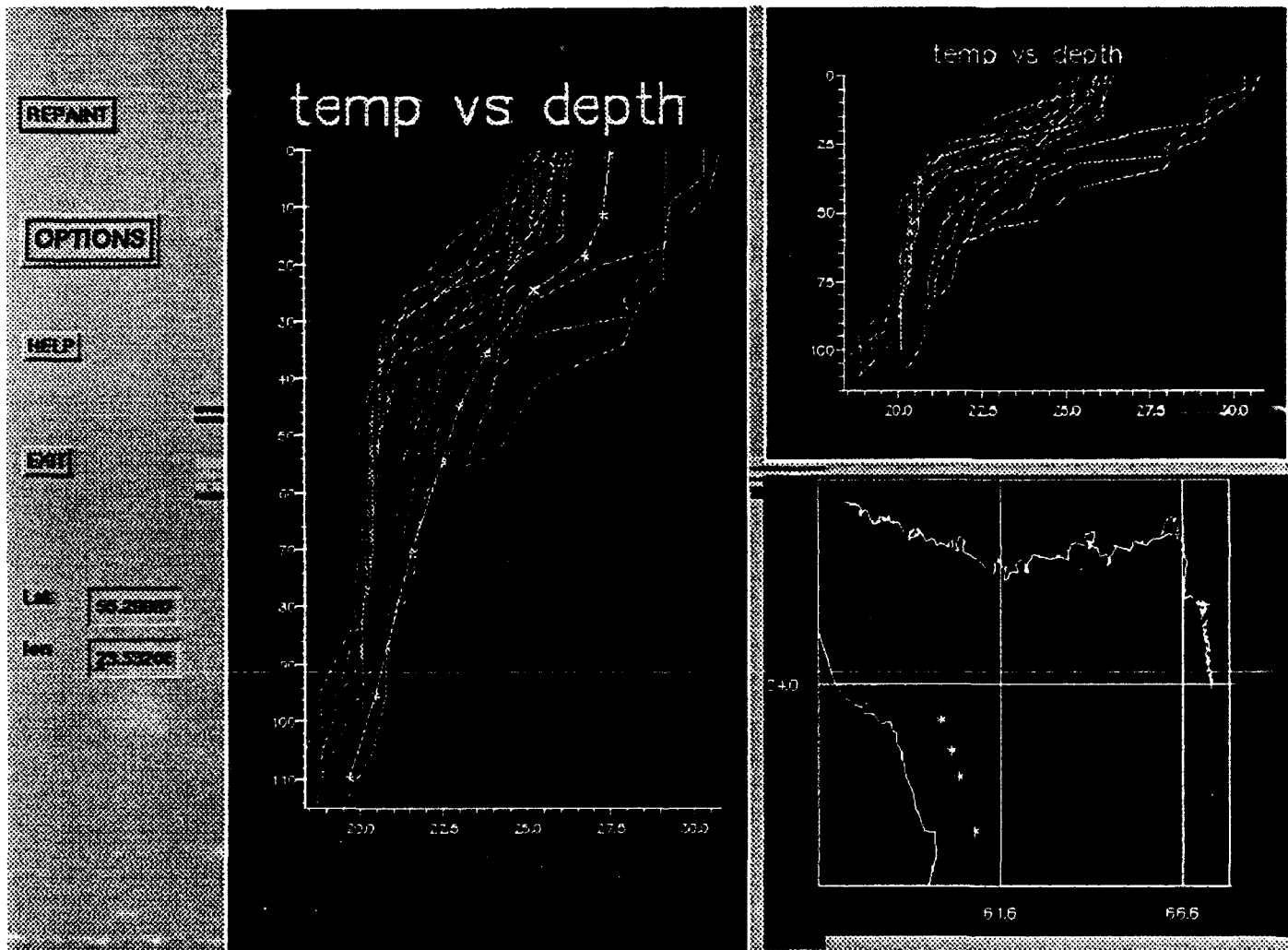


Figure 4. Profile Insertion Window

Repaint: When the "REPAINT" button is clicked, the selected (active) window is refreshed (redrawn). The synthetic profiles will be retained; however, all profiles will be replotted in green. The purpose of "REPAINT" is to clear any profiles or polygons that have been drawn or selected within a given window.

Options: When the "OPTIONS" button is clicked, a pull-down menu appears offering options to (1) view synthetic profiles in red in the active window, or (2) change the boundary limits of the x- and y- axes. When the "SCALE" option is selected, a scale dialog appears. You may specify new ranges by entering the values into the textboxes from the keyboard. When you have finished entering new ranges click the "DONE" button. The selected (blue border) plotting window will be re-plotted using the new x- and y- limits. If you decide not to change the scale, click "CANCEL". If you have selected more than one parameter, you may toggle between the two parameters by clicking the "TOGGLE PARAMETER" button.

Exit: Click the "EXIT" button to exit from "PROFILE INSERTION" mode.

2.3.3 Editing Profiles:

If "PROFILE EDITING" is selected from the "GRAPHICS CHOICE" pull-down menu, another pull-down menu will appear offering the choices "SUSPECT" and "BAD". Once you have selected either "SUSPECT" or "BAD", a list of latitudes and longitudes of the appropriately flagged profiles will appear (Figure 5). You may scroll through this list and make a selection. The "CANCEL" button terminates the profile editing process. The "TOGGLE PARAMETER" button allows switching between parameters if two parameters have been retrieved. The "TABULAR" button allows editing of profiles in a text window. The "GRAPH" button activates a window for graphical editing.

Tabular Editing: When the "TABULAR" button is clicked, a dialog window is displayed listing all depth vs. parameter points for the selected profile (see Figure 6). A textbox appears below the depth vs. parameter listbox. When a depth/parameter pair is selected from the list, the values are displayed in the textbox. You may edit these values from the keyboard. Once each data point pair have been edited, press the "Return" ("Enter") key on the keyboard to indicate completion. The edited values will immediately replace the original values. Click "CANCEL" to abort the editing process. Click the "FLAG" button to tag the edited profile as "Good", "Bad", or "Suspect". Click "DONE" to validate the edited profile and close the dialog window.

Select profile to edit by its latitude & longitude.

LAT LON

| |
|---------------------|
| 22 750000 60 750000 |
|---------------------|

Temp CANCEL TABULAR GRAPH

Figure 5. Latitudes and Longitudes of Flagged Profiles (Profile Editing)

Select level and parameter value.

Modify using keyboard in this textbox.

TABULAR EDITING

| |
|---------------------|
| 0.000000 20.200000 |
| 26.000000 20.100000 |
| 28.000000 20.400000 |
| 34.000000 27.900000 |
| 41.000000 25.200000 |
| 53.000000 24.100000 |
| 58.000000 22.700000 |
| 61.000000 22.000000 |

26.000000 20.100000

HELP Flag CANCEL DONE

Figure 6. Tabular Profile Editing Window

The “GRAPH” Button: When the “GRAPH” button is clicked, a window will appear as shown in Figure 7. You may edit only in the blue-bordered window at the left. The selected profile is plotted in white with an overlay of small “X” icons at existing data points. This profile is also plotted in its representative tag color in the both the depth vs. parameter window to the upper right and the geographical location window to the lower right. Select the option “Pick Edit Points” under the “OPTIONS” pulldown menu. Use the middle mouse button to define the upper and lower limits of the depth range that brackets the section of the profile to be edited. Horizontal lines will be automatically drawn corresponding to the depths of any depth/parameter pairs lying within the bracketed range. Click “Insert Points” from the “OPTIONS” pulldown menu. Then, using the middle mouse button and starting with the uppermost horizontal

line, click to define new parameter values at the depth indicated by each horizontal line (IDEAS assumes that the depth value is correct and only allows modification of the parameter value). If a particular point is not edited, its default values will be retained. Clicking the right mouse button plots a modified profile and invokes a dialog box for tagging the edited profile. If you click the "CANCEL" button, the flag assigned to this profile remains unchanged.

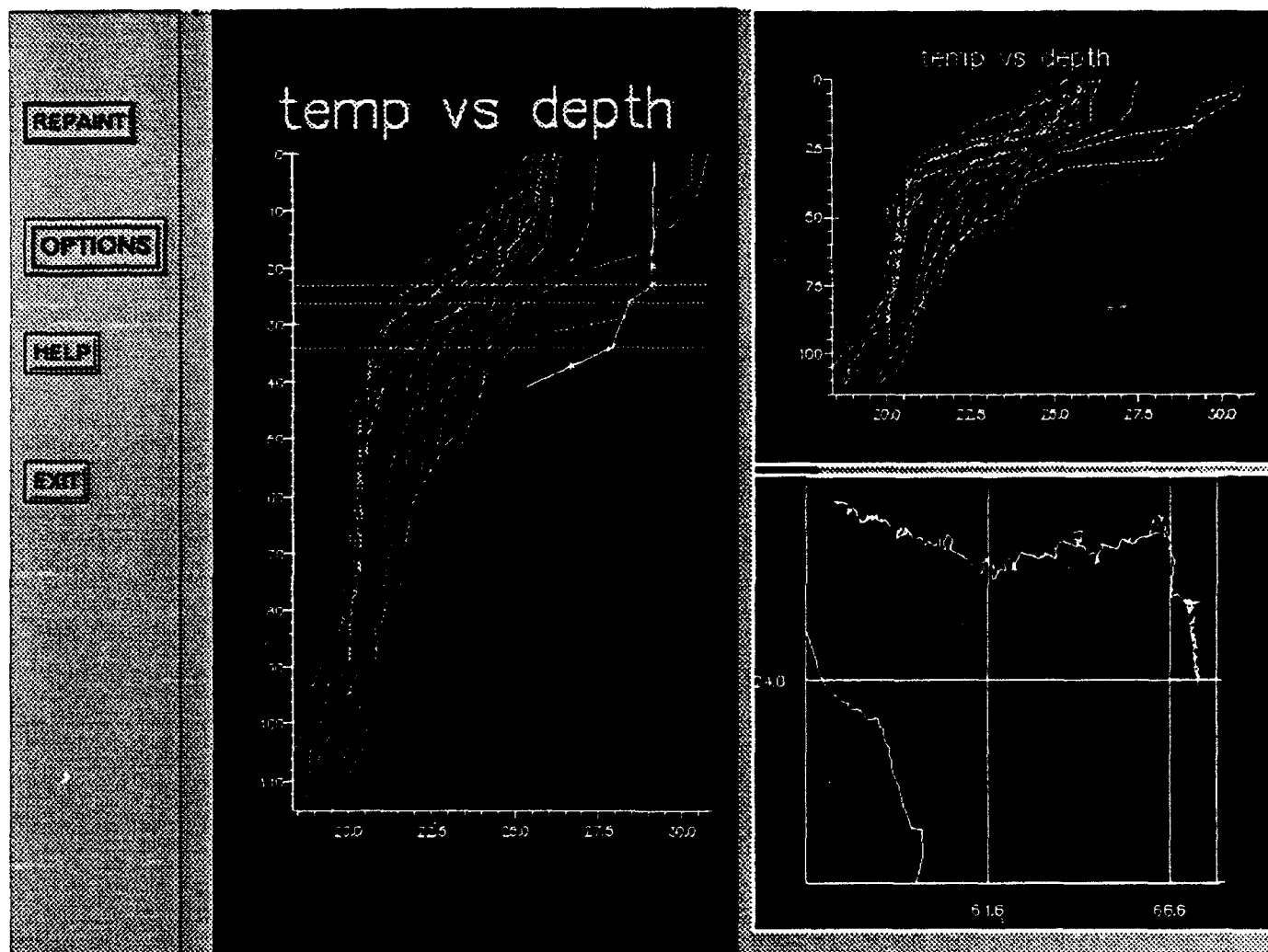


Figure 7. Graphical Profile Editing Window

Repaint:

When the "REPAINT" button is clicked, the active window is refreshed. The purpose of "REPAINT" is to clear profiles and points drawn in the active window.

Options:

The "OPTIONS" pulldown menu contains options to "Pick Edit Points", "Insert Points" and to "Scale" (zoom in or out) the active (blue-bordered) plotting window. The purpose of the "Pick Edit Points" and "Insert Points" options are discussed under the heading 'The "GRAPH" Button' above. When the "Scale" option is clicked, a dialog window appears for modifying the x- and y- axes plotting limits. You may change these boundaries by entering new values into the appropriate textboxes from the keyboard. When "DONE" is clicked, the "Scale" dialog window is closed and the profiles in the active window are replotted at the new scale specified by the new x- and y- boundaries. Click "CANCEL" if you wish to abort a modification to the plotting scale.

Exit:

Click the "EXIT" button to close the graphical editing window and return to the profile editing window.

2.4. Tools

The "TOOLS" pull-down menu offers the following options:

- (1) "READ FROM FILE",
- (2) "WRITE TO FILE",
- (3) "WRITE TO DATABASE", and
- (4) "LOG".

2.4.1. Reading Data from a File:

The purpose of the "READ FROM FILE" option is to permit importation of profile data from a flat file. Before reading a file, you must ensure that an open slot exists in the Data Status Board. If the Data Status Board is full, you must delete ("DEL") an existing dataset entry before reading the file.

Figure 8 illustrates the dialog window that facilitates reading data from a file. To read a file, enter (keyboard) the path to the file into the textbox. (Note: You may also use the X-Windows copy/paste feature to copy a file name from another X-managed window.) You must then specify the file format by selecting the appropriate format from the "FORMATS" listbox and specify whether the file is an "ASCII" or "BINARY" file type by clicking the labeled button. Finally, click the "READ" button. When the "PARAMETER" list (located below the "FORMATS" listbox) is filled, a summary of retrieved data will be displayed in the "Data Status Board". Select the parameter(s) of interest from the "PARAMETER" list and click "EXIT". You may now perform editing and analysis chores on the imported dataset which now resides in memory.

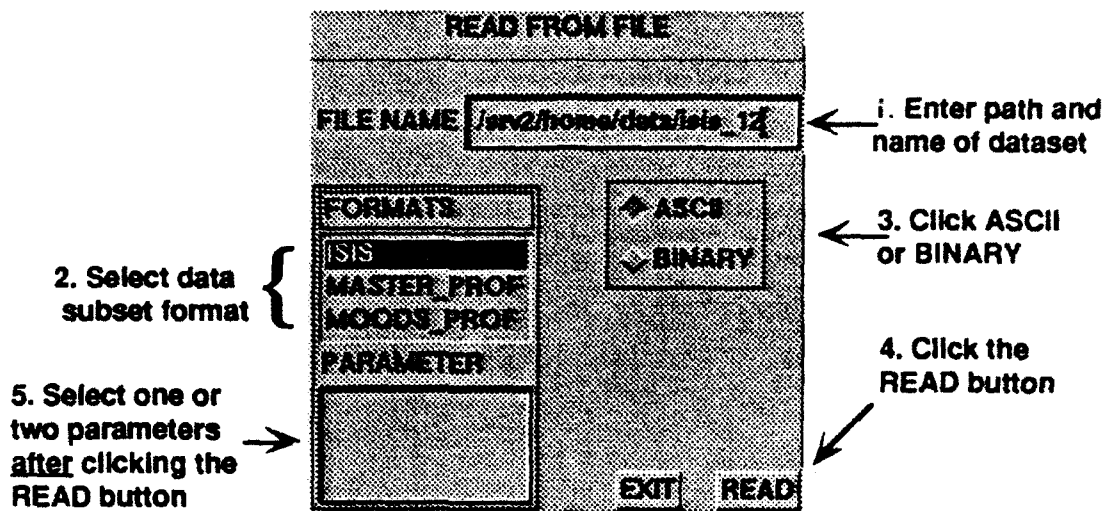


Figure 8. Read from File Dialog Window

If you do not wish to import the dataset, clicking "EXIT" will abort the file import procedure. If an error occurs during file importation, an appropriate message will be displayed in the "REMARKS" textbox.

2.4.2. Writing Data to a File:

When "WRITE TO FILE" is selected from the "TOOLS" pull-down menu, the dialog window illustrated in Figure 9 will appear. This "TOOLS" option allows you to export a data subset to a flat file. You must ensure that a data subset has been selected from the Data Status Board. To export to a file, enter (keyboard) the directory path and filename for the file into the "FILE NAME" textbox. Then, specify the quality control criteria ("QC Type") identifying the profiles to be exported. Finally, specify whether the file is to be written as an ASCII or BINARY file and click "WRITE". The specified data subset will be written to the named file. To leave the "WRITE TO FILE" option, click "EXIT." If an error occurs during export, an appropriate messages will be displayed in the "REMARKS" textbox.

2.4.3. Writing Data to the Database:

The "WRITE TO DATABASE" option permits you to save an edited dataset to the database. First, ensure that a data subset has been selected from the "Data Status Board". When the "WRITE TO DATABASE" option is selected, the dialog window illustrated in Figure 10 will appear. In the dialog window, first specify the "SUBSET NAME" by entering (keyboard) text into the textbox. After specifying the quality control ("QC Type") flags, click the "DATABASE" button.

To leave the "WRITE TO DATABASE" dialog window, click "EXIT". If an error occurs, an appropriate messages will be displayed in the "REMARKS" textbox. If the "SUBSET NAME" already exists, the data subset will be appended to the existing version. You may click "EXIT" at any point prior to clicking the "DATABASE" button to abort the process and close the dialog window.

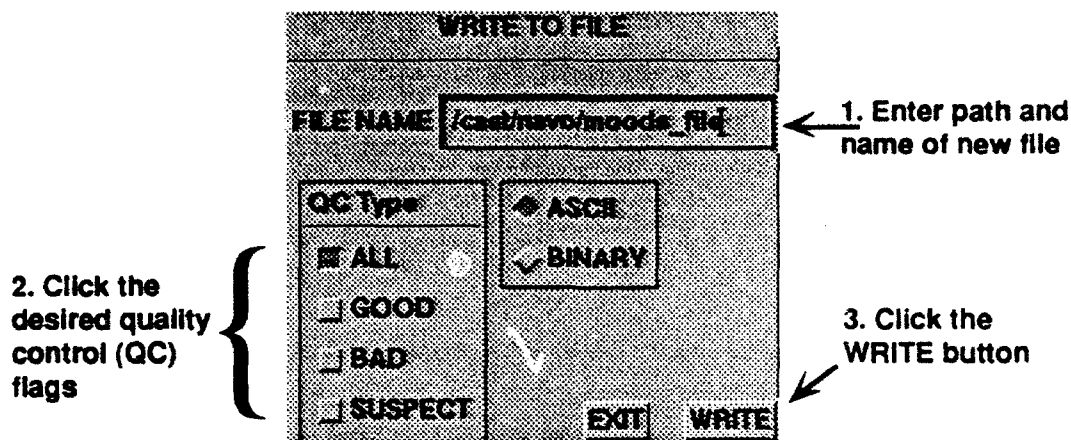


Figure 9. Write to File Dialog Window

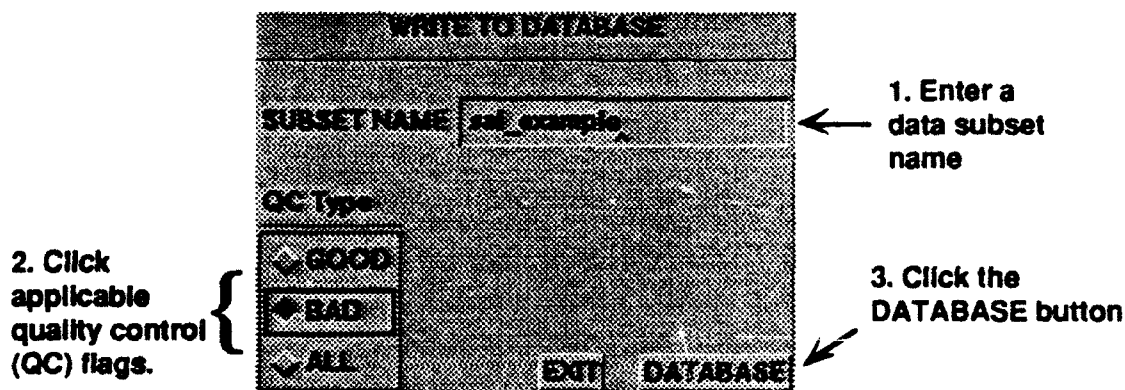


Figure 10. Write to Database Dialog Window

2.4.4. The Data Log Facility:

The purpose of the "LOG" tool is to allow logging of the editing and processing performed on a dataset. When you work with a dataset at a later time, the "Log" will provide a historical record of prior editing on the selected dataset. Before exercising the "LOG" option, you must have selected a data subset from the Data Status Board. When you click on the "LOG" button, an "xedit" text

editing window will appear for you to enter a description of the work performed on a dataset (see Figure 11). Instructions for use of the “xedit” editor may be found in the X-windows “man” pages. The “xedit” text editor has “SAVE” and “QUIT” options.

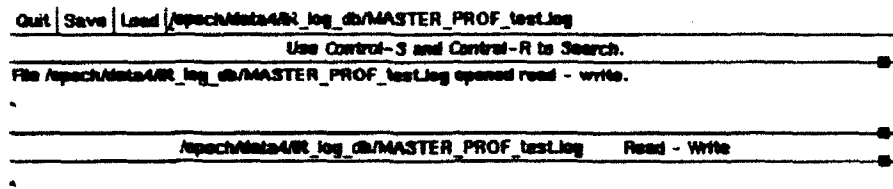


Figure 11. Log Editing Window

2.5. Database Utilities

The “DATABASE” pull-down menu currently allows options for (1) ingesting a data file directly into the database as a subset, and (2) deleting a data subset..

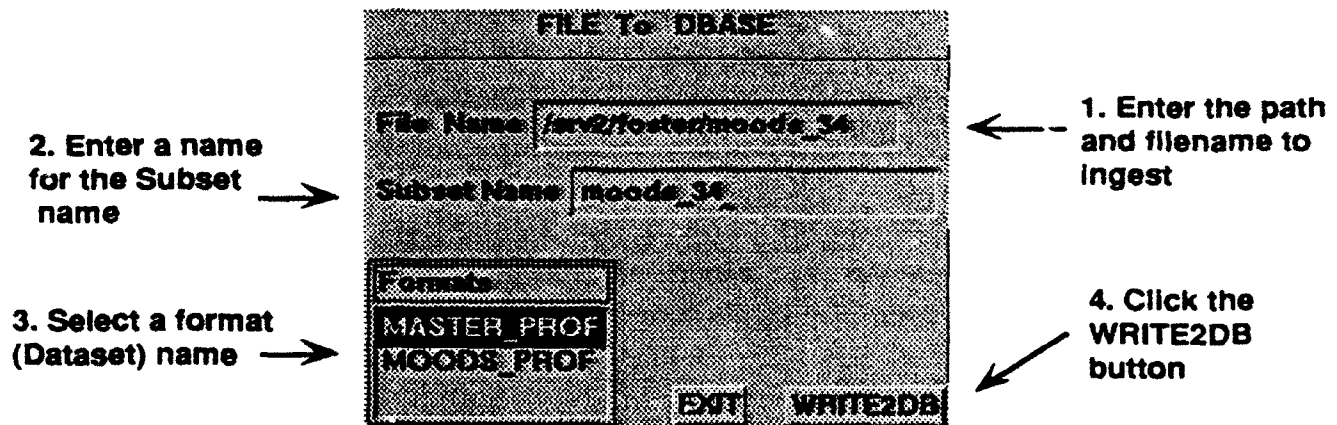


Figure 12. From File to Database Dialog Window

2.5.1. Ingesting Data from a File:

The purpose of the “FROM FILE TO DATABASE” utility function is to ingest a data file directly into the database. When this option is selected a “FILE to DBASE” dialog window will appear as illustrated in Figure 12. Click in (activate) the “File Name” textbox and enter the name of the file you wish to ingest. Next, activate the “Subset Name” textbox and enter a name for the added subset. Then, select the proper format for the file being ingested from the

“Formats” listbox (corresponds to “DATASET” listbox of main IDEAS display). Finally, click the “WRITE2DB” button to read the file and create the new data subset. The “REMARK” textbox on the main display will inform “Data Ingested into Database” if successful. If the named file cannot be found, “REMARK” will inform “File Doesn’t Exist!!!”. To close the “FILE to DBASE” dialog window, click the “EXIT” button.

2.5.2. Deleting a Data Subset:

The “DELETE SUBSET” utility allows a data subset to be removed from the database. You must use this option with great care to avoid destroying important data. When the “DELETE SUBSET” button is selected from the “DATABASE” pull-down menu, a “DELETE SUBSET” dialog window appears as illustrated in Figure 13. To delete a data subset, click the desired format from the “Dataset” listbox. The “SUBSET” listbox will then be filled-in with data subsets available for deletion. After selecting a data subset, choose from among the available date ranges defined by their “LLT ID”. Finally, click the “DELETE” button to delete the selected profiles. To close the “DELETE SUBSET” dialog window, click the “EXIT” button.

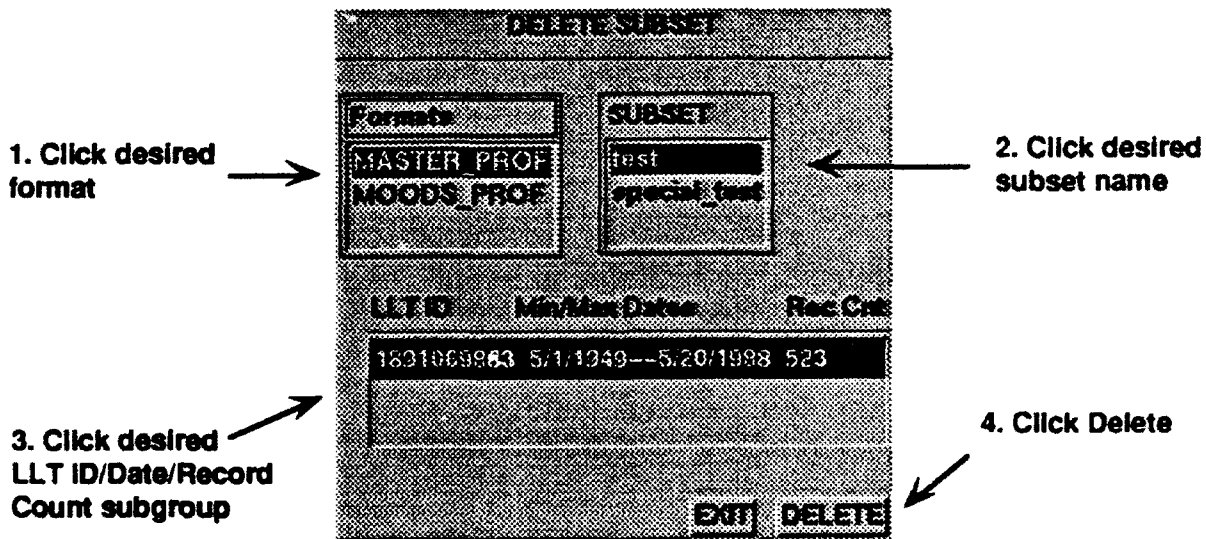


Figure 13. Delete Data Subset Dialog Window

3. Walkthrough of an Example:

This example demonstrates how to select a profile dataset and view edited profiles. The dataset is retrieved from the database and default values are used.

Getting Started:

1. At the system prompt, type "ideas". The IDEAS GUI initial display screen will appear.

Selecting a Dataset:

2. Click on any item in the "DATASET" listbox. Different subsets for that dataset will appear immediately below the "DATASET" listbox in the "SUBSETS" list.

Note : The option "READ FROM FILE" under the "TOOLS" pull-down menu allows data import from a file. Once the data is imported, you may select one or two parameters from the "Parameters" listbox and continue at step 7.

3. Click on any item in the "SUBSET" list. The default values will be loaded into the "Specification for Observations" box.

4. Click on the "Parameters" list to select the parameter(s). You can select no more than two parameters.

5. Click on "Min_Max Range" or "Climatology" in "Time Selection". If you choose "Min Max Range", click on "Time Range" and adjust the scales to set minimum and maximum time range limits. Click "OK". If you choose "Climatology", click on the month list, then, click "OK". Other choices are optional.

6. Click the "OK" button and wait until the dataset is listed in the Data Status Board. The "REMARK" textbox will contain "READING FROM DATABASE" while the database query is in progress. When data retrieval is complete, the "REMARK" textbox will contain "DATASET IS READ" and the next available line within the "DATA STATUS BOARD" will be filled-in with information about the dataset

7. Click the "SEL" button for the appropriate information line within the "DATA STATUS BOARD". Then, click the "OK" button at the lower right of the "DATA STATUS BOARD".

8. At this point you may optionally export the dataset to a file by using the "WRITE TO FILE" option available through the "TOOLS" pull-down menu.

Selecting Graphics:

9. Click on the "GRAPHICS CHOICE" pull-down menu to activate the list of choices. You may choose among "MULTIVIEW", "PROF-INSERTION" and "PROFILE EDITING". See specific sections of this manual for explanation of procedures applicable to each option. Each option provides an "EXIT" button which returns you to the main IDEAS display when clicked.

10. To exit from the IDEAS interface, click the red "QUIT" button at the lower right of the main IDEAS display window. You will be returned to the system prompt.

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